

Application No. 10/090,508
Amendment dated July 12, 2005
Reply to Office Action of April 12, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-124 (cancelled).

125. (currently amended) An apparatus adapted for use in spinal surgery for creating an implantation space at least in part within and across a height of the disc space between two adjacent vertebral bodies of the human spine, each of the adjacent vertebral bodies having an endplate adjacent to the disc space, said apparatus comprising:

a milling block configured at least in part for placement across the height of the disc space and adapted to be engaged to at least a portion of the outer surface of the two adjacent vertebral bodies, said milling block having a leading end for positioning towards the two adjacent vertebral bodies and an opposite trailing end, said milling block having at least a first track configured to provide access to the implantation space to be prepared into a first one of the two adjacent vertebral bodies from said trailing end and through said leading end of said milling block, said first track overlapping a portion of the first one of the adjacent vertebral bodies when said milling block is placed across the height of the disc space, said milling block having at least a second track configured to provide access to the implantation space to be prepared into a second one of the two adjacent vertebral bodies from said trailing end and through said leading end of said milling block, said second track overlapping a portion of the second one of the adjacent vertebral bodies when said milling block is placed across the height of the disc space, at least one of said tracks including opposed substantially planar surfaces for guiding said bone cutting device therebetween; and

Application No. 10/090,506
Amendment dated July 12, 2005
Reply to Office Action of April 12, 2005

a bone cutting device for removing at least a portion of bone from the two endplates adjacent the disc space, said bone cutting device having a central longitudinal axis, said bone cutting device being configured to access one of the endplates of the adjacent vertebral bodies through said milling block along said first track, said bone cutting device being configured to access the other one of the endplates of the adjacent vertebral bodies through said milling block along said second track, each of said first and second tracks being configured to guide movement of said bone cutting device axially along the central longitudinal axis of said bone cutting device and in a direction transverse to the central longitudinal axis of said bone cutting device to remove bone.

126. (previously presented) The apparatus of claim 125, wherein at least one of said tracks is a slot.

Claim 127 (cancelled).

128. (previously presented) The apparatus of claim 125, wherein the vertebral endplates each generally lie in a plane and at least one of said tracks is configured to guide said bone cutting device in a selected position relative to at least one of the vertebral endplates.
129. (previously presented) The apparatus of claim 125, wherein at least one of said tracks in cooperation with said bone cutting device is configured to create the implantation space that is at least in part curved.
130. (previously presented) The apparatus of claim 125, wherein at least one of said tracks in cooperation with said bone cutting device is configured to create the implantation space that is at least a portion of a circle.
131. (previously presented) The apparatus of claim 125, wherein said first track is spaced apart from said second track.
132. (previously presented) The apparatus of claim 131, wherein said second track is at least in part parallel to said first track.
133. (previously presented) The apparatus of claim 131, wherein said second track is at least in part non-parallel to said first track.

Application No. 10/090,506
Amendment dated July 12, 2005
Reply to Office Action of April 12, 2005

134. (previously presented) The apparatus of claim 125, wherein said bone cutting device is configured to cooperate with said tracks to resect bone approximating the shape of the implant to be inserted.
135. (previously presented) The apparatus of claim 134, wherein said bone cutting device is configured to resect bone from only one of the vertebral endplates at a time along each of said tracks.
136. (previously presented) The apparatus of claim 125, wherein said bone cutting device is non-rotating.
137. (previously presented) The apparatus of claim 125, wherein said bone cutting device is one of a drill, burr, router bit, abrader, grinder, rasp, grater, saw, oscillating cutter, vibrating cutter, reciprocating cutter, orbital cutter, and rotating cutter.
138. (previously presented) The apparatus of claim 125, in combination with at least one member for engaging said milling block to at least one of the adjacent vertebral bodies.
139. (previously presented) The apparatus of claim 138, wherein said at least one member includes at least one of a pin, a peg, and a screw.
140. (previously presented) The apparatus of claim 125, wherein said leading end is configured to receive at least one member for securing said milling block to at least one of the vertebral bodies.
141. (previously presented) The apparatus of claim 140, wherein said at least one member is adapted to fixedly secure said milling block to at least one of the adjacent vertebral bodies.
142. (previously presented) The apparatus of claim 125, in combination with a depth limiter for selecting and limiting the penetration depth of said bone cutting device into the disc space.
143. (previously presented) The apparatus of claim 142, in combination with a lock for locking said bone removal device at a selected penetration depth into the disc space.

Application No. 10/090,506
Amendment dated July 12, 2005
Reply to Office Action of April 12, 2005

144. (previously presented) The apparatus of claim 125, in combination with a spinal insert adapted to be inserted into the implantation space formed with said apparatus.
145. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert is an interbody spinal implant.
146. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert is a spinal fusion implant.
147. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert is an artificial disc.
148. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert is a bone graft.
149. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert has sidewalls that are at least in part curved.
150. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert has a shape corresponding to the shape of the implantation space created with said apparatus.
151. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert has a trailing end that is curved side to side to conform to the curvature of the adjacent vertebral bodies.
152. (currently amended) The apparatus of claim ~~144150~~, wherein said spinal insert is in combination with an osteogenic material.
153. (currently amended) The apparatus of claim ~~152158~~, wherein said osteogenic material includes at least one of bone and hydroxyapatite.
154. (previously presented) A method for creating an implantation space across a height of a disc space between adjacent vertebral bodies of the human spine, each of the adjacent vertebral bodies having an endplate adjacent to the disc space, the method comprising the steps of:
 - placing a milling block across the height of the disc space, the milling block having a leading end for positioning towards the adjacent vertebral bodies

Application No. 10/090,506
Amendment dated July 12, 2005
Reply to Office Action of April 12, 2005

and an opposite trailing end, the milling block having at least a first track configured to provide access to the implantation space to be prepared into one of the adjacent vertebral bodies from the trailing end and through the leading end of the milling block, the milling block having at least a second track configured to provide access to the implantation space to be prepared into the other one of the adjacent vertebral bodies from the trailing end and through the leading end of the milling block;

removing bone through the milling block along the first track from one of the adjacent vertebral bodies with a bone cutting device to create a portion of the implantation space;

removing bone through the milling block along the second track from the other one of the adjacent vertebral bodies with a bone cutting device to create another portion of the implantation space, at least one of the removing steps including moving the bone removal device along the width of the vertebral bodies; and

inserting a spinal implant into the implantation space.

155. (currently amended) The method of claim ~~154~~160, further comprising the step of engaging the milling block to at least a portion of an outer surface of at least one of the adjacent vertebral bodies.
156. (currently amended) The method of claim ~~154~~160, further comprising the step of securing the milling block to at least one of the adjacent vertebral bodies.
157. (currently amended) The method of claim ~~156~~162, wherein the step of securing includes securing the milling block to at least one of the adjacent vertebral bodies with at least one of pins, pegs, and screws.

Claim 158 (cancelled).

159. (currently amended) The method of claim ~~154~~160, further comprising the step of combining the spinal implant with an osteogenic material
160. (currently amended) The method of claim ~~159~~165, wherein the osteogenic material includes at least one of bone and hydroxyapatite.

Application No. 10/090,506
Amendment dated July 12, 2005
Reply to Office Action of April 12, 2005

161. (currently amended) The method of claim 154460, wherein the step of inserting includes inserting a spinal implant that is a spinal fusion implant.
162. (currently amended) The method of claim 154460, wherein the step of inserting includes inserting a spinal implant that is an artificial disc.
163. (currently amended) The method of claim 154460, wherein the step of inserting includes inserting a spinal implant that is a bone graft.
164. (currently amended) The method of claim 154460, wherein the implantation space formed by the bone removing steps has a shape corresponding to the shape of the implant to be inserted therein.
165. (currently amended) The method of claim 154460, wherein the step of inserting includes inserting an implant that has a shape corresponding to the shape of the implantation space.
166. (currently amended) The method of claim 154460, wherein the bone removing steps include removing bone from the adjacent vertebral bodies with a non-rotating bone cutting device.
167. (new) The apparatus of claim 125, wherein said bone cutting device has a cutting end with a maximum dimension transverse to the central longitudinal axis that is less than the minimum distance separating said opposed substantially planar surfaces.
168. (new) The apparatus of claim 125, wherein at least one of said first and second tracks has a closed perimeter to limit movement of said bone cutting device transverse to the central longitudinal axis of said bone cutting device.